

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **84112027.2**

(51) Int. Cl.⁴: **B 65 B 11/28**

(22) Date of filing: **08.10.84**

(30) Priority: **13.10.83 IT 358283**

(43) Date of publication of application:
17.04.85 Bulletin 85/16

(84) Designated Contracting States:
CH DE FR GB LI NL

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(54) **Apparatus for plastic film packaging spools of sewing thread and the like.**

(57) The apparatus for plastic film packaging spools of sewing thread and the like comprises an initial winding device (3) for winding the plastic film around a spool (1), which device (3) comprises a pair of guides (4) across the inlets whereof a plastic film is fed, and a pusher (5) which is adapted to insert the spool in between said guides (4); a cutting device (19,20) for cutting off the portion of plastic film which is being wound around said spool (1); a gripper (25) for picking up the spool leaving said guides (4); a folder (37) for folding over the spool a first longitudinal flap of the plastic film partly wound around said spool; and a welding device (42,43) for welding the second longitudinal flap of the plastic film to the first flap. The second flap is adapted to fold, by rotation of the grippers (25), over the first flap in abutment relationship with the welding device (42,43).

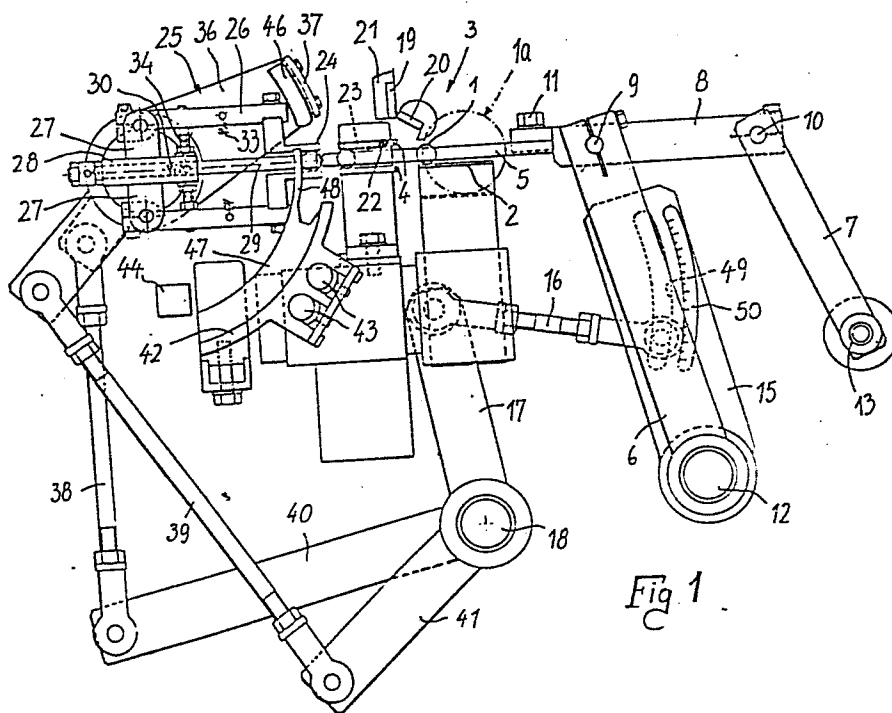


Fig 1 .

"APPARATUS FOR PLASTIC FILM PACKAGING SPOOLS OF SEWING
THREAD AND THE LIKE"

This invention relates to an apparatus for plastic film packaging spools of sewing thread and the like.

As is known, sewing thread is usually sold in
5 spools of tubular shape which are covered with a film of a plastic material, heat sealed longitudinally to the spool. Sometimes the spool is provided at the ends with disk-like expansions confining the area wherearound the thread is wound; in that case, it is common practice
10 to arrange for the plastic film to not only wrap around the thread roll but also around such expansions, to fold frontally on the spool at both sides.

It is an object of this invention to provide such an apparatus which can automatically package sewing thread
15 spools in a plastic film, is of simple design, reliable and versatile in operation, capable of accommodating spools of various shapes and sizes.

This object is achieved by an apparatus for plastic film packaging spools of sewing thread and
20 the like, comprising a means of initially winding said plastic film around the spool, a means of cutting off the plastic film portion wrapped around said spool, a gripping means for gripping the spool as it leaves said means of initially winding the plastic film, a means of
25 folding over the spool a first longitudinal flap of the plastic film wrapped around said spool, and a means of welding the second longitudinal flap of the plastic film to said first flap, characterized in that said gripping means and folding means are carried rotatably

on a shaft lying parallel to the spool axis, and that said welding means comprises a cylinder segment coaxial with said shaft and adapted to cause, the second flap to be folded over and welded to the first flap, during
5 the rotation of said gripping means.

The invention features will be more readily apparent from the following description of a preferred embodiment of this apparatus for plastic film packaging thread spools, with reference to the accompanying
10 illustrative drawings, where:

Figure 1 is a side elevation view of this apparatus; and

Figure 2 is a partly cut-away plan view thereof.

With reference to the drawing views, indicated at
15 1 is a thread spool intended for packaging in a film of a heat sealable plastic material. The spool 1 is caused to rest initially onto a platform 2 which is vertically adjustable to accommodate various spool sizes.

The platform 2 is located centrally to a device
20 for starting to wind the plastic film around the spool, as generally indicated at 3. The initial winding device 3 comprises essentially a pair of vertically aligned guides 4, and a pusher 5 which is effective, by sliding above said platform 2, to insert the spool 1 in between
25 the guides 4.

The pusher 5 is reciprocated through an articulated parallelogram of sort including a pair of arms 6,7 adapted for oscillation on a vertical plane, and a

crossmember 8 hingedly connected at its ends to the tops of said arms through respective pivot pins 9,10; the pusher 5 is secured longitudinally to the crossmember 8 via screw means 11. The arms 6,7 are radially
5 mounted at their lower ends to respective shafts 12,13 which are journalled in the stationary frame 14 of the apparatus. The shaft 12 has keyed radially thereto an additional arm 15, which has one end of an actuating connecting rod 16 pivoted thereto. The other end of
10 the connecting rod 16 is pivoted to a crank arm 17 mounted on the driveshaft 18.

Located above the inlet ends of the guides 4 is a plastic film cutter device comprising a fixed blade 19 and movable blade 20. The fixed blade 19, is rigidly
15 mounted to a plate 21, set vertically above, and orthogonally across, the longitudinal axis of the apparatus defined by the path of movement of the reciprocating pusher 5. Said plate 21 guides the advancing plastic film, driven downwards thereon, and cut thereat, by the
20 moveable blade 20 driven so as to cooperate with said fixed blade 19.

The upper guide 4 incorporates, journalled at 22, a small spring-loaded lever 23 adapted to hold the plastic film stretched around the spool 1. Located
25 at the outlet ends of the guides 4 of the initial winding device 3 are a pair of grippers 25, comprising a pair of superimposed jaws 24 adapted to grip the spool 1 therebetween. The jaws 24 are carried on respective short arms 26 which are journalled on
30 respective brackets 27 extending vertically at opposite

sides of a tubular block 28. A stem 29 is slidable along the block 28 for insertion in between the jaws 24 of said grippers; the stem 29 is elastically linked to the block through a spring 30 which is mounted, in
5 alignment with the longitudinal axis of the stem, by means of pegs 31,32, secured to the block and stem respectively.

The short arms 26 of the grippers are urged elastically towards each other by a pair of springs
10 33, each comprising a screw 34 which acts against the block 28 to permit adjustment of the gripping range. The grippers 25 are carried radially at the end of a shaft 35 journaled in the stationary frame of the apparatus. Mounted rotatably on the shaft 35 is a holder
15 36 for a sector folding element 37 which is adapted to be lowered onto the jaws 24 of the grippers. The angular rotation of the grippers 25 and folding element 37 is driven through respective connecting rods 38,39 which are pivotally connected to crank arms 40,41 fast with
20 the driveshaft 18.

Mounted below the grippers 25 is a welding or sealing device, which comprises a cylinder segment 42 coaxial with the shaft 35 and adjoining the jaws 24 of the grippers, said cylinder segment providing a housing
25 for conventional heater means 43.

At the welder 42 outlet end, a detent 44 is adapted to engage with a lug 45 on the upper jaw, so as to spread the grippers 25 open.

The apparatus heretofore described operates as
30 follows.

The spool 1, as laid onto the platform 2, is driven by the reciprocating pusher 5 in between the guides 4; prior to entering the gap between said guides, the spool 1 is caused to strike the plastic film which is moving vertically down in contact with the plate 21 and forcing it to wrap itself around the spool. Simultaneously therewith, the movable blade 20 of the cutter device is driven to cut off a required portion from the plastic film for packaging the spool. In moving through the guides 4, the spool 1 will raise the spring-loaded lever 23 which, by pressing down on the spool, ensures that the plastic film is held stretched thereon.

At the end of its stroke, the pusher 5 will insert the spool 1 in between the jaws 24 of the grippers 25. Then, the folding element 37 is actuated rotatively which, on being lowered onto the jaws of said grippers, causes the upper flap of the plastic film to be wrapped onto the spool.

At this time, the grippers 25 are rotated angularly to cause the jaws 24 to slide across the curved surface of the welder 42. On contacting said curved surface, the lower flap of the plastic film will fold over and be welded to the upper flap. It should be noted that the spool held in the grippers is being acted upon elastically by the stem 29, which provides an adequate pressure force during the welding process.

On leaving the welder 42, the detent 44, on striking the lug 45, will hold back the upper jaw 24 of the grippers 25, thereby the latter is caused to

release the packaged spool.

In order to package a spool comprising disk-like expansions at its ends, the folding element 37 and welder 42 have peripheral walls, 46 and 47 respectively
5 provided thereon. The wall 46 produces a first fold in the plastic film, frontally to the spool at either side thereof; in that case, it is, of course, envisaged that the plastic film has a greater width than the longitudinal dimension of the spool.

10 A second front fold of the plastic film over the first is produced by the expansion 48 of the wall 47, which wall will then effect welding of the plastic film.

It should be noted that in order to enable packaging of thread spools having different sizes, as indicated
15 at 1a in Figure 1, additionally to height adjustment of the platform 2 and opening the guides 4 and grippers 25, it is envisaged that the stroke distance of the pusher 5 be adjustable.

To that aim, the arm 15 is formed with a slot 49
20 which permits the pivot point on the connecting rod 16 to be varied with reference to the scale 50.

In practicing the invention, any materials, shapes, and dimensions may be selected contingent on individual requirements.

CLAIMS

1 1. An apparatus for plastic film packaging spools
2 of sewing thread and the like, comprising a means (3)
3 of initially winding said plastic film around the
4 spool (1), a means (19,20) of cutting off the plastic
5 film portion wrapped around said spool, a gripping
6 means (25) for gripping the spool (1) as it leaves
7 said means (3) of initially winding the plastic film,
8 a means (37) of folding over the spool a first longitu-
9 dinal flap of the plastic film wrapped around said
10 spool, and a means (42,43) of welding the second longi-
11 tudinal flap of the plastic film to said first flap,
12 characterized in that said gripping means (25) and
13 folding means (37) are carried rotatably on a shaft
14 (35) lying parallel to the spool (1) axis, and that
15 said welding means comprises a cylinder segment (42)
16 coaxial with said shaft (35) and adapted to cause,
17 the second flap to be folded over and welded to the
18 first flap, during the rotation of said gripping means.

1 2. An apparatus according to Claim 1, characterized
2 in that said means (3) of initially winding said
3 plastic film comprise a pair of guides (4) across inlet
4 ends whereof the plastic film is fed and a pusher (5)
5 inserting said spool (1) in between said guides (4)
6 and striking said plastic film with one side.

1 3. An apparatus according to Claim 1 and 2, character-
2 ized in that said gripping means (25) comprises a pair of
3 jaws (24) movable together with respective short arms
4 (26) which are journalled on respective brackets (27),
5 extending substantially vertically at opposed sides

6 of a tubular block (28) made rigid with said shaft
7 (35) and slidably accommodating a spring loaded stem
8 (29) applying a pressure force on said spool when
9 gripped in said jaws.

1 4. An apparatus according to Claim 1, characterized
2 in that said folding means comprises a folding element
3 (37) movable frontally towards the jaws (24) of said
4 gripping means (25).

1 5. An apparatus according to the preceding claims,
2 characterized in that said folding element (37) and
3 said cylinder segment (42) have, at lateral edges
4 thereof, small peripheral walls (46,47) for folding
5 and welding of the plastic film at opposed ends
6 of the spool.

1 6. An apparatus according to Claim 2, characterized
2 in that said guides (4) have journaled thereon a small
3 spring-loaded lever (23) pressing on said spool (1)
4 and holding said plastic film stretched thereon.

1 7. An apparatus according to Claim 2, characterized
2 in that said pusher (5) is reciprocated by means of an
3 articulated parallelogram (6,8) of sort oscillating
4 on a vertical plane.

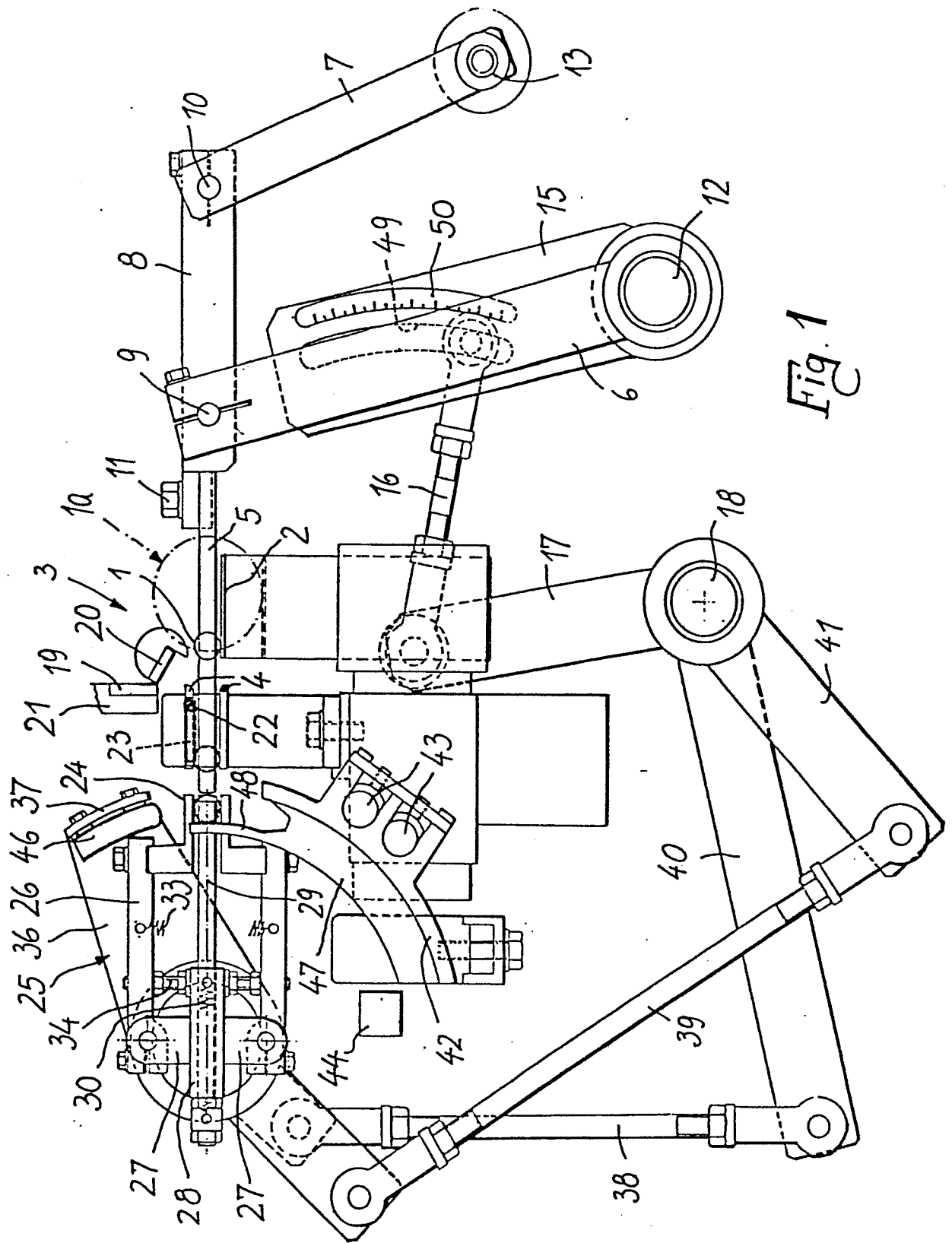


Fig. 1

Fig. 2

